This invention relates to new and useful improvements in a heater for motor vehicles and boats.

The invention contemplates arranging the water and steam heater within the vehicle so as to supply heat during the winter.

A further object of the invention is the provision of a mechanism for automatically controlling the supplying of water to the heater, when the radiator of the motor vehicle is supplied with the water.

Another object in the construction of a device as described which is simple and durable and which can be manufactured and sold at a reasonable cost.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawing, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawing forming a material part of this disclosure:

Fig. 1 is a side elevational view of a vehicle provided with a heater constructed according to this invention.

Fig. 2 is a fragmentary side elevational view of a portion of the vehicle, showing particularly the motor and radiator, equipped with the heater according to this invention.

Fig. 3 is a fragmentary enlarged detailed view of a portion of Fig. 2 showing in particular the water coil and its arrangement in the exhaust.

Fig. 4 is a fragmentary enlarged sectional view of a portion of Fig. 2 showing in particular the by-pass for the exhaust.

Fig. 5 is a vertical sectional view of the heater per se.

Fig. 6 is a fragmentary enlarged detailed view of a portion of Fig. 2 showing a detail of the radiator and the mechanism for controlling the water supply to the heater.

Fig. 7 is a fragmentary view similar to Fig. 2 but illustrating another embodiment of the invention.

The heater for motor vehicles and boats, according to this invention, is used in combination with a motor 10 having an exhaust 10a and a water radiator 10b for the cooling thereof. In Fig. 1 an automobile 11 is illustrated equipped with the motor to which the heater, according to this invention, is applied.

The heater comprises a hollow casing 12 with a plurality of air passages 13 from the front to the back, these passages comprising merely tubes, and said casing being adapted to be located in the body of the vehicle as indicated in Fig. 1; preferably upon the dashboard to supply heat to the vehicle.

A fan 14 is adapted to blow atmospheric air through the passages 13. A means is provided for operating the fan. A water coil 15 is arranged in the exhaust for boiling water, and is connected by top and bottom pipes 16 and 17 respectively with top and bottom portions of the casing 12 for conveying steam and water, respectively.

The fan 14 is supported upon a shaft 18 of a steam turbine 19 mounted within the casing 12. The pipe 16 is connected with the steam inlet for the turbine. The outlet for the turbine is indicated by reference numeral 19b and discharges within the casing 12. The details of the turbine will not be given in this specification as they form no part of the invention and steam turbines are generally known. The basic principle is that steam travelling at a velocity is directed by nozzles against buckets on a rotor. The rotor is connected with the shaft 18. This steam turbine comprises the means for operating the fan 14.

The water coil 15 is enclosed in a tube 20 which is attached by couplings 21 and 22 upon the ends thereof, with the exhaust 10a. This is possible by first removing a portion of the exhaust pipe and substituting the tube 20 in its place. The tube 20 is of a larger diameter than the exhaust so as to compensate for the compass taken up by the coil 15 and not impair the travel of the exhaust gases. The pipe 16 connects with the top of the coil 15. The coil is either arranged vertically, as disclosed in the form of the invention illustrated in Fig. 7, or at an inclination as shown in Fig. 2. It must have one end at a higher elevation than the other end. The pipe 17 connects with the lower end of the coil. The pipes 16 and 17 are connected with the coil 15 by couplings 23.

The exhaust 10a is provided with a by-pass 10c which extends from a point above the coil 15 to a point below the coil 15. A deflecting valve 25 is arranged at the top junction of the by-pass and the normal exhaust line, and controls the flow of the exhaust gases through one passage to the other. More particularly, the valve 25 is a butterfly valve operated by a handle 26 located upon the outside of the exhaust pipe. In one position, the valve 25 engages upon a seat 27 which is obliquely across the exhaust passage leading to the coil 15. In another posi-
tion the butterfly valve may engage upon a seat 28 which is obliquely across the by-pass 18. The butterfly valve may be manually set so as to cut the heater out of operation, or place it into operation, as desired.

The heater is provided with a liquid conveying agent 30, preferable water. This water is at a level so that the coil 15 is full of water, and the lower portion of the casing 12 holds some water. The operation of the device consists in the exhaust gases causing the water in the coil 15 to boil so that the steam passes through the pipe 16 and discharges into the turbine 18, and from the turbine discharges into the top portion of the casing 12. This heats the air tubes and the atmospheric air will be heated from the tubes.

A means is provided for automatically supplying the heater with water whenever the radiator 34 of the vehicle is supplied. This is necessary, as some of the water 30 will be continuously lost due to leakage in the systems and evaporation. A pipe 31 connects the water supply line 17 with the water compartment of the radiator 10. A valve 32 is interposed in the pipe line 31. This valve is operated by handle 33. The handle 33 connects with a rod 34 which is slidably mounted in a sliding block 35 attached on the radiator 10. The upper end of the rod 34 extends through an opening 36 in the neck of the radiator 10 and terminates in a vertical portion 37 engaging against the radiator cap 37. A spring 38 acts between the standard 35 and a collar 39 on the rod 34 for normally urging the rod upwards. The rod is restrained by the cap 37. When the cap 37 is removed, as is necessary when water is added to the radiator 10, the rod 37 will be moved upwards by the spring 38. This motion opens the valve 32. The valve normally is closed.

In Fig. 7 another embodiment of the invention has been disclosed which distinguishes from the prior form in two respects. First, the coil 15 is arranged in the vertical as previously explained. Second, the by-pass 18 is connected by the pipe fittings with the exhaust pipe 10. Furthermore, a valve 40 is interposed in the by-pass 18 and a valve 41 in the exhaust 10 above the coil 15. The exhaust 10 or the other may be opened to direct the exhaust gases either through the by-pass or around the coil 15. The valves 40 and 41 are hand operated.

While we have illustrated and described the preferred embodiment of our invention, it is to be understood that we do not limit ourselves to the precise construction herein disclosed and the right is reserved to all changes and modifications coming within the scope of our invention as defined in the appended claims.

Having thus described our invention, what we claim as new, and desire to secure by United States Letters Patent is:

1. In combination with a motor having a hot exhaust, a heater casing with air passages from the front to the rear for location in the body of the vehicle, a fan adapted to blow air through said passages, means for operating said fan, a water coil in said exhaust for boiling water, top and bottom pipes connecting the ends of said coil with top and bottom portions of said casing for conveying steam and water respectively to and from the coil and the heater casing, said motor having a water radiator with a removable cap, and a water supply pipe connected with said radiator and controlled with a valve operated by an operator actuated when said cap is removed.

2. In combination with a motor having a hot exhaust, a heater casing with air passages from the front to the rear for location in the body of the vehicle, a fan adapted to blow air through said passages, means for operating said fan, a water coil in said exhaust for boiling water, top and bottom pipes connecting the ends of said coil with top and bottom portions of said casing for conveying steam and water respectively to and from the coil and the heater casing, said motor having a water radiator with a removable cap, and a water supply pipe connected with said radiator and controlled with a valve operated by an operator actuated when said cap is removed, said operator comprising a rod connected with said valve and resiliently urged in a normal position against the radiator cap, whereby when the radiator cap is removed the rod may move to operate the valve.

3. In combination with a motor having a hot exhaust, a heater casing with air passages from the front to the rear for location in the body of the vehicle, a fan adapted to blow air through said passages, means for operating said fan, a water coil in said exhaust for boiling water, top and bottom pipes connecting the ends of said coil with top and bottom portions of said casing for conveying steam and water respectively to and from the coil and the heater casing, said motor having a water radiator with a removable cap, and a water supply pipe connected with said radiator and controlled with a valve operated by an operator actuated when said cap is removed, said operator comprising a rod connected with said valve, a standard fixed upon said rod, a collar fixedly mounted on said rod, a spring resiliently engaged on said rod and acting between said standard and said collar, said spring resiliently urging said rod into a normal position against the radiator cap, whereby when the radiator cap is removed the rod moves to operate the said valve.

LOUIS MORNEAULT.

ERMA J. LYDA.

THOMAS J. NIUTTA.